

Work Order ID 139422

Friday, November 27, 2015 3:21:30 PM

139422

Page 1

Item ID: D6006-129 Accept ***N900040100*** Setup Start ***NS1***
 Revision ID: Stop ***NS2***
 Item Name: Crosstube Material
 Start Date: 11/27/2015 Start Qty: 17.00 ***17*** Cust Item ID:
 Required Date: 4/29/2016 Req'd Qty: 17.00 ***17*** Customer:
 Reference:

Approvals: Process Plan: MCS Date: 12-11-30 Tooling: _____ Date: _____ Run Start ***NR1***
 QC: _____ Date: _____ SPC (Y/N): _____ Date: _____ Stop ***NR2***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
Draw Nbr	Revision Nbr								
D6006	Rev A								

100

0.00

100

Purchasing

Purchasing

PURCHASING

Memo

Issue P/O: 30644

0.00

CL

DEC 03 2015 17

- a) Order as per Dwg D6006
 - b) Material: 3.250 x 0.515 wall 7075-T6/T6511 (WW-T-700/7 or QQ-A-225/9 or QQ-A-200/11) seamless aluminum tube
 - c) Minimum ultimate tensile strength = 77 ksi
 - d) Minimum tensile yield strength = 66 ks
 - e) Material cert's is required
- ***EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS.***

MUST BE WELL PACKAGE, IF NOT IT WILL BE REFUSE

DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____	DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐	AGAINST DEPARTMENT/PROCESS Skid-tube ☐ Machining ☐ Thermoforming ☐ Large Fab ☐ Cross tube ☐ Small Fab ☐ Finishing ☐ Composite ☐ Water Jet ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐ Supplier ☐ Engineering ☐ Quality ☐ Other ☐			
Date : _____	Step #: _____	QTY Effective : _____		MRB (QSI042) Approval	
Description Work Order Deviation			Disposition		
			Completed By		
			Lead hand / Supervisor Approval Verification		
			QC / QA Coordinator Approval		
Root Cause		FAULT CATEGORY			
Environment ☐ Design ☐ Doc/Data ☐ Equip/Tooling ☐ Handling/Pre ☐ Material ☐ Internal Transport ☐ Tribal Knowledge ☐ LOA ☐ Substation ☐ Past Expiry Date ☐ Misidentified ☐	No Re-verification ☐ Operator ☐ Offset/Setup ☐ Supplier ☐ Training ☐ Use for Testing ☐ Poor Information ☐ Rushing ☐ Product Improvement ☐ Process Improvement ☐ Manufacturing Process ☐ Past Due ☐	Pressure/Forced ☐ Bending ☐ Centre Not Concentric ☐ Cracks ☐ Crimp/Kink/Ripple/Wave ☐ Cuffs ☐ Crushing ☐ Heat Treat ☐ Wave/Twist in Tube ☐ Marks/Chatter ☐	Temperature/Cure ☐ Set-up ☐ BOM/Route ☐ Broken/Damage/Defect ☐ Inspection Incomplete/Unqualified ☐ Contamination ☐ Countersink ☐ Cut Too Short ☐ Instructions Incomplete/Unclear ☐ Drill Holes ☐	Power Loss/Surge ☐ Folio/Program ☐ Grain ☐ Weld ☐ Wrong Stock Pulled ☐ Out of Sequence ☐ Off-set ☐ Mislabelled ☐ Fit/Function ☐ Misaligned/off center ☐	Positioned Wrong ☐ Outside Dimensions ☐ Over/Under tolerance ☐ Part Incorrect ☐ Part Lost/Missing ☐ Part Moved ☐ Drawing ☐ Finish ☐ Misread ☐ Turning Sequence ☐
☐ OTHER : _____					

Work Order ID 139422

139422

Page 2

Friday, November 27, 2015 3:21:30 PM

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Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____ Run Start ***NR1***
 QC: _____ Date: _____ SPC (Y/N): _____ Date: _____ Stop ***NR2***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
110	Receive & Inspect for Damage & Mat'l Certs	0.00							
110									
Packaging	Memo	0.01							
Packaging	Ensure material certification is attached								
120	QC6- Inspect dimensions to drawing	0.00							
120									
QC	Memo	0.00							
Quality Control	Ensure Material certification comply to Dwg D6006								
150	Identify as per dwg & Stock Location: <u>shed</u>	0.00							
150									
Packaging	Memo	0.00							
Packaging	LOCATION : LG003								

17x 8p/6 2/28
 DAS
 16
 8-89
 2016/04/29
 P10 →
 17
 16/05/02

DQA: _____ Date: _____

**WORK ORDER NON-CONFORMANCE / UPDATE**

QA Closed: _____ Date: _____

Work Order update only ☒

Work Order: <u>139422</u> Part No. <u>D6006-129</u> NCR No. _____		DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐		AGAINST DEPARTMENT/PROCESS <table style="width:100%;"> <tr> <td>Skid-tube ☐</td> <td>Cross tube ☐</td> <td>Water Jet ☐</td> <td>Engineering ☐</td> </tr> <tr> <td>Machining ☐</td> <td>Small Fab ☐</td> <td>Prod. Eng. Coord. ☐</td> <td>Quality ☐</td> </tr> <tr> <td>Thermoforming ☐</td> <td>Finishing ☐</td> <td>Rec/Store/Packaging ☐</td> <td>Other ☐</td> </tr> <tr> <td>Large Fab ☐</td> <td>Composite ☐</td> <td>Supplier ☐</td> <td></td> </tr> </table>						Skid-tube ☐	Cross tube ☐	Water Jet ☐	Engineering ☐	Machining ☐	Small Fab ☐	Prod. Eng. Coord. ☐	Quality ☐	Thermoforming ☐	Finishing ☐	Rec/Store/Packaging ☐	Other ☐	Large Fab ☐	Composite ☐	Supplier ☐																																															
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Date : <u>2016/04/28</u>		Step #: <u>120</u>		QTY Effective : _____		MRB (QSI042) Approval DMS 16 9-89 <u>2016/04/28</u>																																																																	
Description Work Order Deviation				Disposition																																																																			
Change step #120 to QC18 inspection								Completed By 16.05.03																																																															
								Lead hand / Supervisor Approval Verification																																																															
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OTHER : _____																																																																							

Work Order ID 139422***139422***

Page 3

Item ID: D6006-129

Accept

N900040100Setup Start ***NS1***

Revision ID:

Item Name: Crosstube Material

Stop ***NS2***

Start Date: 11/27/2015 Start Qty: 17.00

17

Cust Item ID:

Required Date: 4/29/2016 Req'd Qty: 17.00

17

Customer:

Reference:

Approvals:

Process Plan: _____

Date: _____

Tooling: _____

Date: _____

Run Start ***NR1***

QC: _____

Date: _____

SPC (Y/N): _____

Date: _____

Stop ***NR2***Sequence ID/
Work Center IDOperation
DescriptionSet Up/
Run Hours

Tool ID

Tool #

Plan
CodeAccept
QtyReject
QtyReject
NumberInsp.
Stamp

160

QC21- Final Inspection - Work Order Release

0.00

160

QC

Memo

0.03

Quality Control

MLJ MAY 03 2016

Em 16/05/02

DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____		DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐		AGAINST DEPARTMENT/PROCESS Skid-tube ☐ Machining ☐ Thermoforming ☐ Large Fab ☐ Cross tube ☐ Small Fab ☐ Finishing ☐ Composite ☐ Water Jet ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐ Supplier ☐ Engineering ☐ Quality ☐ Other ☐					
Date :		Step #:		QTY Effective :				MRB (QSI042) Approval	
Description Work Order Deviation				Disposition				Completed By	
								Lead hand / Supervisor Approval Verification	
								QC / QA Coordinator Approval	
Root Cause Environment ☐ Design ☐ Doc/Data ☐ Equip/Tooling ☐ Handling/Pre ☐ Material ☐ Internal Transport ☐ Tribal Knowledge ☐ LOA ☐ Substation ☐ Past Expiry Date ☐ Misidentified ☐ No Re-verification ☐ Operator ☐ Offset/Setup ☐ Supplier ☐ Training ☐ Use for Testing ☐ Poor Information ☐ Rushing ☐ Product Improvement ☐ Process Improvement ☐ Manufacturing Process ☐ Past Due ☐		FAULT CATEGORY Pressure/Forced ☐ Bending ☐ Centre Not Concentric ☐ Cracks ☐ Crimp/Kink/Ripple/Wave ☐ Cuffs ☐ Crushing ☐ Heat Treat ☐ Wave/Twist in Tube ☐ Marks/Chatter ☐ Temperature/Cure ☐ Set-up ☐ BOM/Route ☐ Broken/Damage/Defect ☐ Inspection Incomplete/Unqualified ☐ Contamination ☐ Countersink ☐ Cut Too Short ☐ Instructions Incomplete/Unclear ☐ Drill Holes ☐ Power Loss/Surge ☐ Folio/Program ☐ Grain ☐ Weld ☐ Wrong Stock Pulled ☐ Out of Sequence ☐ Off-set ☐ Mislabeled ☐ Fit/Function ☐ Misaligned/off center ☐ Positioned Wrong ☐ Outside Dimensions ☐ Over/Under tolerance ☐ Part Incorrect ☐ Part Lost/Missing ☐ Part Moved ☐ Drawing ☐ Finish ☐ Misread ☐ Turning Sequence ☐							
OTHER : ☐									

Picklist Print

Friday, November 27, 2015 3:21:33 PM

Page 1

Work Order ID: 139422

139422

Parent Item: D6006-129

D6006-129

Parent Item Name: Crosstube Material

Start Date: 11/27/2015

Required Date: 4/29/2016

Start Qty: 17.00

Required Qty: 17.00

Comments: IPP Rev:C04.06.15 Added tolerance to Step 2KJ/JLM

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Qty per Kit	Total Qty	Qty Issued	Date Issued	Status
---------------------------------	------------------------	---------------	-------------	---------------------	------------------	-----------------	--------------------	----------------	-------------	--------------	---------------	----------------	--------

D6006-129P

Purchased

No

110

Each

0.0000

1

17

D6006-129P

Crosstube Material

17 X 8/21/16-04-28

DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____		DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐		AGAINST DEPARTMENT/PROCESS Skid-tube ☐ Machining ☐ Thermoforming ☐ Large Fab ☐ Cross tube ☐ Small Fab ☐ Finishing ☐ Composite ☐ Water Jet ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐ Supplier ☐ Engineering ☐ Quality ☐ Other ☐					
Date :		Step #:		QTY Effective :			MRB (QSI042) Approval Completed By Lead hand / Supervisor Approval Verification QC / QA Coordinator Approval		
Description Work Order Deviation				Disposition					

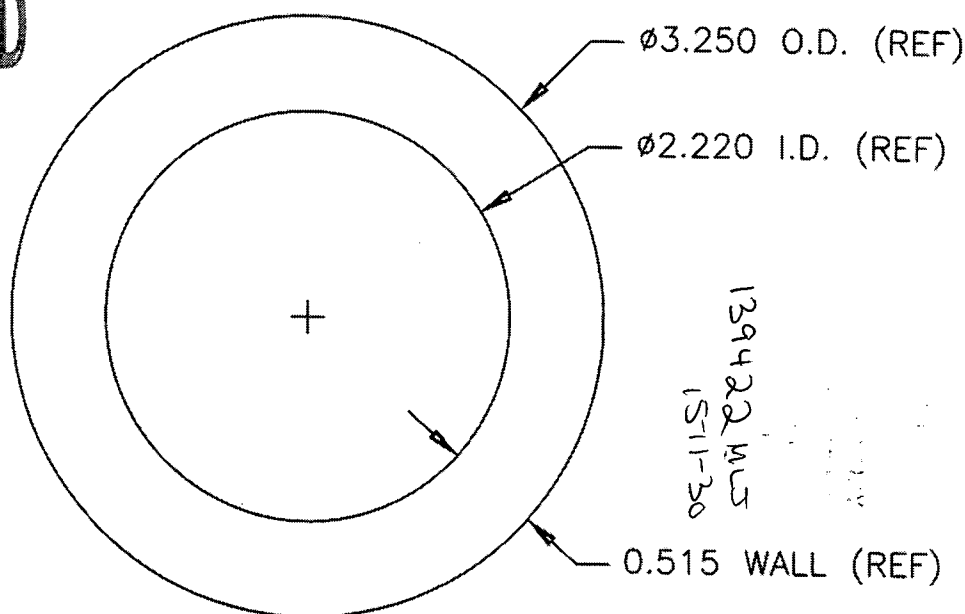
Root Cause				FAULT CATEGORY			
Environment ☐	Design ☐	Doc/Data ☐	Equip/Tooling ☐	Pressure/Forced ☐	Temperature/Cure ☐	Power Loss/Surge ☐	Positioned Wrong ☐
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				Marks/Chatter ☐	Drill Holes ☐	Misaligned/off center ☐	Turning Sequence ☐
				OTHER : ☐			



DESIGN <i>CP</i>	DRAWN BY <i>CP</i>	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
CHECKED <i>A</i>	APPROVED <i>A</i>	DRAWING NO. D6006	REV. A SHEET 1 OF 1
DATE 00.11.17		TITLE CROSSTUBE MATERIAL	SCALE 1:1
A	00.11.17	NEW ISSUE	

SPECIFICATION CONTROL DRAWING

RELEASED
00.11.24 *A*



NOTES

- 1) D6006-XXX CROSSTUBE
LENGTH

WHERE XXX IS LENGTH IN INCHES
EG. 129" LONG TUBE: D6006-129

- 2) MATERIAL: 3.250 OD x 0.515 WALL 7075-T6/T6511 (WW-T-700/7 OR QQ-A-225/9 OR QQ-A-200/11) SEAMLESS ALUMINUM TUBE.
MINIMUM ULTIMATE TENSILE STRENGTH = 77 ksi
MINIMUM YIELD TENSILE STRENGTH = 66 ksi
- 3) TOLERANCES ARE PER ASTM B210 AS FOLLOWS:
O.D.: ± 0.008 MEAN (± 0.016 INCLUDING OVALITY)
WALL: ± 0.020 MEAN (± 0.052 INCLUDING ECCENTRICITY)
LENGTH: XXX $+0.188/-0.000$
STRAIGHTNESS: 0.010" DEVIATION / 12" LENGTH
- 4) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.
- 5) CHEMICAL CONVERSION COAT PER DART QSI 005 4.1

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Dart Aerospace Ltd.
1270 Aberdeen Street
Hawkesbury, ON K6A 1K7
Tel: 613 632 9577
Fax: 613 632 1053

PURCHASE ORDER

Purchase Order ID **PO30644**

Purchase Order Date 12/3/2015

PO Print Date 1/6/2016

Page Number 1 of 6

Order From :

VU-ALU001

Ship To : DART AEROSPACE LTD

ALUMINIUMWERK UNNA AG
630 3033 SOUTH PARKER RD
AURORA, CO 80014
USA

1270 ABERDEEN
HAWKESBURY, ON K6A 1K7
CANADA

REVISED \$

Contact Name

Buyer

Chantal Lavoie

Vendor Phone

303 755 5672

Customer POID

Customer Tax #

10127-2607

Ship To Contact

Terms

Wire

Ship To Phone

Currency

USD

Ship Via:

Contract Shipping

FOB

DDP - (Delivered Duty Paid)

Ship Acct:

Line Nbr	Reference Vendor Part Number Line Comments Delivery Comments	Description/ Mfg ID	Req Date/ Taxable Promise Date	CD	Req Qty/ Unit of Measure	PO Unit Price	Extended Price
1	D6005-128P EXTRUDE AS PER DWG D6008-128 REV. B B139414	Crosstube Material	5/2/2016 Yes 5/2/2016		28.00 Each <i>new 30</i>	\$462.00	\$12,936.00
Line Total:							\$12,936.00
2	D6006-129P EXTRUDE AS PER DWG D6006-129 REV. A B139422	Crosstube Material	5/2/2016 Yes 5/2/2016		17.00 Each <i>SP16-01-28</i>	\$889.00	\$15,113.00
Line Total:							\$15,113.00
3	D6008-132P EXTRUDE AS PER DWG D6008-132 REV. A B139421	Crosstube Extrusion	8/30/2016 Yes 8/30/2016		20.00 Each	\$689.00	\$13,780.00

PO Instructions: QUOTE DEL. 2016-2017 (002)

Note:

1/6/2016



consignee : DART AEROSPACE LTD.
HAWKESBURY

client: 40980

confirmation # : 59326/200

purchase order : P030644

AWU article : 35311 / 3,250 x ,515 x 129,000 - ,000 I

client article : D6006-129 3.250 X 0.515 X 129

alloy : EN AW-7075 Int. Alloy No. : 7075

quantity : 17 gross : 556,000 Kg
length : 3.277,00 MM net : 449,000 Kg
package id : 129127 piece : 1 case no. : 1
pcs. / length / cast no. / heat no
17x3277,00/4484 - 804615

information :
supplier : Aluminiumwerk Unna AG Uelzener Weg 36 - D-59425
contact : fon +49(0)2303-206- 0 fax +49(0)2303-206-116
: 25.03.2016

SP/6-04-28

order confirmation

59326

page: 2
date: 1.06.2016
customer: 40980

Tubes protected with corrosion protective oil
Tubes line marked

Packing: seaworthy wooden cases

item	quantity	unitprice	USD	unit value	USD	delivery
200	17,000	PC	889,00	PC	15.113,00	May 02, 2016

AWU article: 35311 / Tariff no. 76082081
Customer article: D6006-129 3.250 X 0.515 X 129 / cust. drwg.
product: Tubes / seamless extruded / EN AW-7075 / round
condition: T 6511 / AMS-QQ-A-200/11(A)

8816-04-28

outer diameter: 3,250 INCH Tol. +0,016 -0,016
inner diameter: 2,220 INCH
wall thickness: 0,515 INCH Tol. +0,052 -0,052
fixed length 129,000 INCH Tol. +0,188

test report acc. to EN 10204/3.1 / RM 531 / Rp0,2: 455
straightness 0,01 INCH / 1 FEET / RMS max.: outer 25
tol. on quantity +10 % -10 % / scurfed
3.250" OD 0.515" Wall, 129" lengths
Part Number D6006-129 crosstube
Surface Finish max. RMS 25
Tolerances per ASTM B210 / drawing D6006
Tubes protected with corrosion protective oil
Tubes line marked

Packing: seaworthy wooden cases

item	quantity	unitprice	USD	unit value	USD	delivery
300	20,000	PC	689,00	PC	13.780,00	August 29, 2016

despatch date change

AWU article: 36783 / Tariff no. 76082081
Customer article: D6008-132 3.250 X 0.438 X 132 / cust. drwg.
product: Tubes / seamless extruded / EN AW-7075 / round
condition: T 6511 / AMS-QQ-A-200/11(A)

outer diameter: 3,250 INCH Tol. +0,016 -0,016
tol. for mean OD +0,008 -0,008
inner diameter: 2,374 INCH
wall thickness: 0,438 INCH Tol. +0,044 -0,044
fixed length 132,000 INCH Tol. +0,125

inspection cert. acc. to EN10204/3.1 / RM 531 / Rp0,2: 455
straightness 0,01 INCH / 1 FEET / RMS max.: outer 25
tol. on quantity +10 % -10 % / scurfed
3.250" OD 0.438" Wall, 132" lengths

Abnahmeprüfzeugnis 3.1 - DIN EN 10204:2005

Inspection Certificate 3.1 - DIN EN 10204:2005 / Certificat de Reception 3.1 - DIN EN 10204:2005

Kunde: Dart Aerospace Ltd.
Client: 1270 Aberdeen Street
 K6A1K7 Hawkesbury, ON Canada

Zeugnisnummer: 372/16
 Cert No.: / No. du certificat:
Bestellnummer: PO30644
 Order No. / No. de commande
Auftrag: 59326/200
 Our Reference/Notre Reference:

Produkt: Rohre nahtlos gepresst
 Product / Produit: Tubes seamless extruded
Spezifikation: AMS - QQ - A - 200/11A; -
 Specification:

Werkstoff: 7075
 Alloy/Alliage: **Zustand:** T 6511
 Temper/État

Abmessung 3,250 INCH x 2,220 INCH x 0,515 INCH x 129,000 INCH
 Size / Dimension D6006-129

Kennzeichnung Cert No. 372/16 - ALUnna - 7075 - T6511 - Cast No. 4484 - AMS - QQ - A - 200/11(A) - 3,250" OD X 0.515" Wall - Heat Lot No.
 Marking/Marquage: 804615 - ALUnna order Conf No. 59326/200 - 1 - P.O.30644

Lieferung pcs. lbs
 Delivered Material / Matériel délivré: 17 990
Country of Manufacture: Germany
 Products are in accordance with applicable RoHS

1. Chemische Analyse Chemical Analysis / analyse chimique

Charge/ min.	Si	Fe	Cu	Mn	Mg	Cr	Zn	Ti	Pb	Zr	Bi	Sn	Ni	Na
Cast No. max.	0,40	0,50	1,2 2,0	0,30	2,1 2,9	0,18 0,28	5,1 6,1	0,20						
4484/15	0,204	0,202	1,447	0,103	2,483	0,194	5,723	0,038	0,004	0,0169	0,0001	0,0016	0,0060	0,0002

Hydrogen content: 0,15 ccm/100 g Al Elements without indication < 0,01 % country of melt manufacturer: Germany

2. Mechanische Eigenschaften Mechanical Properties / Valeurs Mécaniques

Anforderungen Requirements	tensile (Rm) ksi	yield (Rp0,2) ksi	elongation 2" %	elongation A %	Hardness HB	Heat Lot No.
	81,0	72,0	7,0			
1	81,490	73,950	10,0			804615
2	81,635 ✓	74,095 ✓	10,0			

RMS: outside 25 - max. 9,8 µ"

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Ergebnis der Prüfungen: Es wird bestätigt, daß die Lieferung geprüft wurde und den Vereinbarungen bei der Bestellannahme entspricht

Test results: We confirm that the delivery has been tested and applies to the agreements made on receipt of the order
Resultats: Nous confirmons que la livraison a été contrôlée et correspond avec les conventions faites à la réception de la commande

mergardtri



Certified acc. DIN EN ISO 9001:2008 and DIN EN 9100:2009
 valid until 2016-11-10

Cert.- Req. No.: 001959 QM08; 001959 ASH 09-1

29.03.2016

ALUnna

Aluminiumwerk Unna AG, Uelzener Weg 36, 59425 Unna, Germany

Abnahmebeauftragter

MATERIAL RECEIPT INSPECTION FORM

MATERIAL: D6006 129
 DATE: 2016 / 04 / 28

PO / BATCH NO.: PO 30644 / B139422

MATERIAL CERT REC'D: Yes
 QUANTITY RECEIVED: 17 PLS
 QUANTITY INSPECTED: ~~10 PLS~~ 7 PLS
 QUANTITY REJECTED: _____

THICKNESS ORDERED: see Attached Extrusion
 THICKNESS RECEIVED: Report
 SHEET SIZE ORDERED: n/a
 SHEET SIZE RECEIVED: n/a

DESCRIPTION	NCR (Check Y/N)	COMMENTS
SURFACE DAMAGE	Y ☒	
CORRECT FINISH	☒ N	
CORROSION	Y ☒	
CORRECT GRAIN DIRECTION	☒ N	
CORRECT MATERIAL	☒ N	7075T6
CORRECT THICKNESS	Y N	see Attached Extrusion Report
PHOTO REQUIRED	Y ☒	
CORRECT MATERIAL	☒ N	AMS-00-A-200
CORRECT REF # TO LINK CERT	☒ N	PO 30644
CORRECT MATERIAL IDENTIFICATION	Y N	n/a
CORRECT M# ON THE MATERIAL	Y N	n/a
DOES THIS MATERIAL REQUIRE ENGINEERING SIGN OFF	Y ☒	
DOES THIS REQUIRE AN EXTRUSION REPORT	☒ N	

CUT SAMPLE PIECE OF MATERIAL AND PERFORM A HARDNESS CHECK. RECORD RESULTS BELOW					
TYPE OF MATERIAL	HRC	HRB	DUR A	DUR D	n/a
SIZE OF TEST SAMPLE					
HARDNESS / DUROMETER READING					

testers located in the Quality Office

QC 18 INSPECTION		ENGINEERING SIGNOFF (if required)	
INSPECTED BY: <u>DAS</u> <u>16</u> 9-89	SIGNED OFF BY: _____		
DATE: <u>2016/04/29</u>	DATE: _____		

Attach this inspection sheet with the corresponding material cert and remit to be scanned and received in

MATERIAL RECEIPT INSPECTION FORM

INSTRUCTIONS FOR INSPECTING BAR, TUBING, ROUND, & SHEET STOCK

- 1- VERIFY STOCK TO DART PURCHASE ORDER
- 2- MEASURE ALL DIMENSIONS FOR EACH PURCHASED STOCK
 - a. WIDTH, THICKNESS, DIAMETER, WALL THICKNESS & LENGTH
- 3- VERIFY CONDITION OF MATERIAL i.e. DAMAGED, CORRODED, etc.
- 4- VERIFY THAT SUPPLIER HAS A NUMBER (HEAT #) ON ITS RECEIVING REPORT TO LINK TO MATERIAL CERTS
- 5- VERIFY MATERIAL CERTS ARE CORECT TO THE DART PO INSTRUCTIONS
- 6- REMOVE / CUT A PIECE OF MATERIAL FOR SAMPLE HARDNESS TESTING

INSTRUCTIONS FOR INSPECTING SKIDTUBE & STEP EXTRUSION

- 1- VERIFY TO DART SUPPLIED DRAWING
- 2- SAMPLE INSPECT MATERIAL IN BUNDLE TO ENSURE MATERIAL CAN BE RECEIVED INTO DART
- 3- USING PORTABLE HARDNESS TESTER VERIFY HARDNESS OF THE MATERIAL TO THE DRAWING
- 4- VERIFY THAT MATERIAL CERTS MATCH TO WHATS CALLED UP ON THE DART DRAWING

AFTER MATERIAL PASSES INSPECTION

- 5- HAVE DART EMPLOYEES START STOCKING MATERIAL BUT REQUEST MIN **20pcs** FOR FULL INSPECTION
- 6- INSPECT ALL DIMS AS PER DRAWING REQUIRMENTS

INSTRUCTIONS FOR INSPECTING CROSS TUBE MATERIAL

- 1- VERIFY MATERIAL CERTS MATCH THE REQUIRMENTS ON THE DART DRAWINGS
- 2- INSPECT MIN. HALF THE BATCH OF EXTRUSION RECEIVED INTO DART
- 3- INSPECT MATERIAL AS PER THE EXTRUSION REPORT
 - a. WALL THICKNESS USING ULTRA-SONIC IN 4 LOCATIONS
 - b. OUTSIDE DIAMETETER HIGHEST/LOWEST BOTH ENDS
 - c. INSIDE DIAMETER HIGHEST/LOWEST BOTH ENDS
 - d. STRAIGHTNESS @ CENTER OVER 12" SPAN
 - e. WALL THICKNESS USING TUBE MICROMETER HIGHEST/LOWEST BOTH ENDS
- 4- IDENTIFY EACH TUBE IN SEQUENCE OF INSPECTING (TUBE 1, TUBE2.....) AND W/O# AND PO#
- 5- RECORD ALL FINDINGS ON EXTRUSION REPORT

IF ANY QUESTIONS PLEASE SEE QC CORR DINATOR BEFORE GOING FURTHER

EXTRUSION INSPECTION SHEET



TUBE #	TOTAL LENGTH	SIDE A		SIDE B		Measurement unit		Symbol		ULTRA SONIC MEASUREMENTS					
		DIA		DIA		INSIDE DIA	wall thickness measured w/vern	Strightness at 12" in middle	Rockwell Reading	LOCATION on tube	R1	R2	R3	R4	
		R1	R2	R1	R2										
DWG	129"	3.25"				2.22"	0.515"	0.01"	N/A	Middle	N/A				
1	129"	3.243"	3.247"	3.252"	3.248"	2.219"	0.522"	0.519"	0.003"	N/A	Middle	0.518"	0.523"	0.529"	0.525"
2	129"	3.25"	3.256"	3.25"	3.256"	2.21"	0.522"	0.519"	0.004"	N/A	Middle	0.522"	0.519"	0.517"	0.523"
3	129"	3.255"	3.256"	3.252"	3.25"	2.209"	0.526"	0.51"	0.009"	N/A	Middle	0.521"	0.521"	0.522"	0.523"
4	129"	3.246"	3.252"	3.25"	3.254"	2.221"	0.522"	0.517"	0.006"	N/A	Middle	0.517"	0.524"	0.521"	0.516"
5	129"	3.249"	3.252"	3.247"	3.252"	2.221"	0.518"	0.521"	0.009"	N/A	Middle	0.507"	0.521"	0.533"	0.522"
6	129"	3.251"	3.258"	3.244"	3.252"	2.21"	0.505"	0.52"	0.009"	N/A	Middle	0.517"	0.524"	0.521"	0.518"
7	129"	3.246"	3.248"	3.247"	3.25"	2.22"	0.516"	0.519"	0.007"	N/A	Middle	0.512"	0.522"	0.522"	0.514"
8	"	"	"	"	"	"	"	"	"	N/A	Middle	"	"	"	"
9	"	"	"	"	"	"	"	"	"	N/A	Middle	"	"	"	"
10	"	"	"	"	"	"	"	"	"	N/A	Middle	"	"	"	"
11	"	"	"	"	"	"	"	"	"	N/A	Middle	"	"	"	"
12	"	"	"	"	"	"	"	"	"	N/A	Middle	"	"	"	"
13	"	"	"	"	"	"	"	"	"	N/A	Middle	"	"	"	"
14	"	"	"	"	"	"	"	"	"	N/A	Middle	"	"	"	"
15	"	"	"	"	"	"	"	"	"	N/A	Middle	"	"	"	"
16	"	"	"	"	"	"	"	"	"	N/A	Middle	"	"	"	"
PART # D6006-129		P/O# 30644				BATCH # 8139422				Notes:					

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MEAN OUTSIDE DIAMETER PERMISSIBLE ± 0.006 side A									
Tube #	Actual A	Actual B	Mean	Nominal	Tolerance	min allowable dimension	max allowable dimension	Results for min allowable	Results for max allowable
1	3.243	3.247	3.245	0.00	0.006	-0.006	0.006	3.251	3.239
2	3.250	3.256	3.253	0.00	0.006	-0.006	0.006	3.259	3.247
3	3.255	3.256	3.256	0.00	0.006	-0.006	0.006	3.262	3.250
4	3.246	3.252	3.249	0.00	0.006	-0.006	0.006	3.255	3.243
5	3.249	3.252	3.251	0.00	0.006	-0.006	0.006	3.257	3.245
6	3.251	3.258	3.255	0.00	0.006	-0.006	0.006	3.261	3.249
7	3.246	3.248	3.247	0.00	0.006	-0.006	0.006	3.253	3.241

MEAN OUTSIDE DIAMETER PERMISSIBLE ± 0.006 Side B									
Tube #	Actual A	Actual B	Mean	Nominal	Tolerance	min allowable dimension	max allowable dimension	Results for min allowable	Results for max allowable
1	3.252	3.248	3.250	0.00	0.006	-0.006	0.006	3.256	3.244
2	3.250	3.256	3.253	0.00	0.006	-0.006	0.006	3.259	3.247
3	3.252	3.250	3.251	0.00	0.006	-0.006	0.006	3.257	3.245
4	3.250	3.254	3.252	0.00	0.006	-0.006	0.006	3.258	3.246
5	3.247	3.252	3.250	0.00	0.006	-0.006	0.006	3.256	3.244
6	3.244	3.252	3.248	0.00	0.006	-0.006	0.006	3.254	3.242
7	3.247	3.250	3.249	0.00	0.006	-0.006	0.006	3.255	3.243

OUTSIDE DIA. Permissible (with Ovality) ± 0.012 side A							
Tube #	Actual A	Nominal	Tolerance	min allowable dimension	max allowable dimension	Results for min allowable	Results for max allowable
1	3.243	0.000	0.012	-0.012	0.012	3.255	3.231
2	3.250	0.000	0.012	-0.012	0.012	3.262	3.238
3	3.255	0.000	0.012	-0.012	0.012	3.267	3.243
4	3.246	0.000	0.012	-0.012	0.012	3.258	3.234
5	3.249	0.000	0.012	-0.012	0.012	3.261	3.237
6	3.251	0.000	0.012	-0.012	0.012	3.263	3.239
7	3.246	0.000	0.012	-0.012	0.012	3.258	3.234

OUTSIDE DIA. Permissible (with Ovality) ± 0.012 side b							
Tube #	Actual A	Nominal	Tolerance	min allowable dimension	max allowable dimension	Results for min allowable	Results for max allowable
1	3.252	0.000	0.012	-0.012	0.012	3.264	3.240
2	3.250	0.000	0.012	-0.012	0.012	3.262	3.238
3	3.252	0.000	0.012	-0.012	0.012	3.264	3.240
4	3.250	0.000	0.012	-0.012	0.012	3.262	3.238
5	3.247	0.000	0.012	-0.012	0.012	3.259	3.235
6	3.244	0.000	0.012	-0.012	0.012	3.256	3.232
7	3.247	0.000	0.012	-0.012	0.012	3.259	3.235

OUTSIDE DIA. Permissible (with Ovality) ± 0.012 side A							
Tube #	Actual B	Nominal	Tolerance	min allowable dimension	max allowable dimension	Results for min allowable	Results for max allowable
1	3.247	0.000	0.012	-0.012	0.012	3.259	3.235
2	3.256	0.000	0.012	-0.012	0.012	3.268	3.244
3	3.256	0.000	0.012	-0.012	0.012	3.268	3.244
4	3.252	0.000	0.012	-0.012	0.012	3.264	3.240
5	3.252	0.000	0.012	-0.012	0.012	3.264	3.240
6	3.258	0.000	0.012	-0.012	0.012	3.270	3.246
7	3.248	0.000	0.012	-0.012	0.012	3.260	3.236

OUTSIDE DIA. Permissible (with Ovality) ± 0.012 side b							
Tube #	Actual B	Nominal	Tolerance	min allowable dimension	max allowable dimension	Results for min allowable	Results for max allowable
1	3.252	0.000	0.012	-0.012	0.012	3.264	3.240
2	3.250	0.000	0.012	-0.012	0.012	3.262	3.238
3	3.252	0.000	0.012	-0.012	0.012	3.264	3.240
4	3.250	0.000	0.012	-0.012	0.012	3.262	3.238
5	3.247	0.000	0.012	-0.012	0.012	3.259	3.235
6	3.244	0.000	0.012	-0.012	0.012	3.256	3.232
7	3.247	0.000	0.012	-0.012	0.012	3.259	3.235

end measuement with vern

Mean OUTSIDE DIA. Permissible +- 0.015									
Tube	Actual A	Actual B	Mean	Nominal	Tolerance	min	max	min	max
1	0.522	0.519	0.521	0.515	0.015	0.500	0.530	0.0205	-0.010
2	0.522	0.519	0.521	0.515	0.015	0.500	0.530	0.0205	-0.010
3	0.526	0.510	0.518	0.515	0.015	0.500	0.530	0.018	-0.012
4	0.522	0.517	0.520	0.515	0.015	0.500	0.530	0.0195	-0.011
5	0.518	0.521	0.520	0.515	0.015	0.500	0.530	0.0195	-0.011
6	0.505	0.520	0.513	0.515	0.015	0.500	0.530	0.0125	-0.018
7	0.516	0.519	0.518	0.515	0.015	0.500	0.530	0.0175	-0.013

OUTSIDE DIA. Permissible +- 0.038								
Tube	Actual A	Actual B	Nominal	Tolerance	min	max	min	max
1	0.522	0.519	0.515	0.038	0.477	0.553	0.045	-0.034
2	0.522	0.519	0.515	0.038	0.477	0.553	0.045	-0.034
3	0.526	0.510	0.515	0.038	0.477	0.553	0.049	-0.043
4	0.522	0.517	0.515	0.038	0.477	0.553	0.045	-0.036
5	0.518	0.521	0.515	0.038	0.477	0.553	0.041	-0.032
6	0.505	0.520	0.515	0.038	0.477	0.553	0.028	-0.033
7	0.516	0.519	0.515	0.038	0.477	0.553	0.039	-0.034

center measurment with ultra sonic

Mean OUTSIDE DIA. Permissible +- 0.015									
Tube	highest	lowest	Mean	Nominal	Tolerance	min	max	min	max
1	0.529	0.518	0.524	0.515	0.015	0.500	0.530	0.0235	-0.006
2	0.523	0.517	0.520	0.515	0.015	0.500	0.530	0.02	-0.010
3	0.523	0.521	0.522	0.515	0.015	0.500	0.530	0.022	-0.008
4	0.524	0.516	0.520	0.515	0.015	0.500	0.530	0.02	-0.010
5	0.533	0.507	0.520	0.515	0.015	0.500	0.530	0.02	-0.010
6	0.524	0.517	0.521	0.515	0.015	0.500	0.530	0.0205	-0.010
7	0.522	0.512	0.517	0.515	0.015	0.500	0.530	0.017	-0.013

OUTSIDE DIA. Permissible +- 0.038								
Tube	highest	lowest	Nominal	Tolerance	min	max	min	max
1	0.529	0.518	0.515	0.038	0.477	0.553	0.052	-0.035
2	0.523	0.517	0.515	0.038	0.477	0.553	0.046	-0.036
3	0.523	0.521	0.515	0.038	0.477	0.553	0.046	-0.032
4	0.524	0.516	0.515	0.038	0.477	0.553	0.047	-0.037
5	0.533	0.507	0.515	0.038	0.477	0.553	0.056	-0.046
6	0.524	0.517	0.515	0.038	0.477	0.553	0.047	-0.036
7	0.522	0.512	0.515	0.038	0.477	0.553	0.045	-0.041